

Executive Registry

83-4559/1

10 March 1982

NOTE FOR: EA/DDI

This note asks for a bit of gracious assistance from some of OSWR's fine officers.

The Deputy Director received the attached letter and enclosure recently. A response needs to be created this week -- on Friday at the latest -- so that the DDCI may sign it no later than this weekend. (I expect that he will be out of town most of next week and, on Monday, for the few hours when he will be here, his schedule is dense.) To make it all easier, I propose that the final version be typed in my office. Thus, if you would formally just ask your fine people -- such as [redacted] or [redacted] - to create a draft, I will take it from there. To speed up the process, I gave an advance copy to [redacted] on Tuesday. The letter back should be warm and gracious, and include any substantive points (at an unclassified level, of course) that are appropriate and useful -- if any.

STAT  
STAT  
STAT

If there is anything I may do to assist you, such as answer questions, please let me know.

Thanks in advance for your great help.

STAT

Attachment

cc: UGC [redacted]

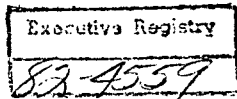
STAT

P310



# Harvard Business Review

Boston, Massachusetts 02163 Tel: 617-495-6371  
Kenneth R. Andrews, Editor



*D. Gump*

March 2, 1982

Mr. Bobby Inman  
Deputy Director  
Central Intelligence Agency  
Washington, DC 20505

Dear Mr. Inman:

Just before the publication of each issue of the Harvard Business Review, we select an article and ask a few particularly qualified readers to comment on it. This provides us with good feedback on the content of our magazine, but since we sometimes publish these replies in subsequent issues of the Review, it also provides our readers with a balanced and broadened awareness of our articles and their ramifications.

Despite the worsening of US relations with countries of the Eastern bloc, American companies may be missing important opportunities if they bypass the technology of the East. According to John W. Kiser III in "Tapping Eastern Bloc Technology" (HBR March-April, 1982), the West has underestimated the technical capabilities of the East because of ideological differences, but several large US corporations have found highly useful products and processes from that part of the world.

A preprint of this article is enclosed, and we would very much appreciate any comments you may have on the way the subject has been handled. If you would like us to review your letter for use in the next issue, we would like to receive your comments before March 16. Even if you cannot make this deadline, please send in your comments as soon as possible so that we can consider them for publication.

Sincerely yours,

*Kenneth R. Andrews*

KRA/md  
Enclosure

# Tapping Eastern bloc technology

*John W. Kiser III*

---

*Reprinted from*



**Harvard  
Business Review**

*March-April 1982*

No. 82207



# Harvard Business Review

March-April 1982

Kenneth R. Andrews, *Editor*  
G. Scott Hutchison, *Executive Editor*,  
*Production Operations*  
David W. Ewing, *Managing Editor*  
Timothy B. Blodgett, *Senior Editor*,  
*Editorial Operations*  
Eliza G.C. Collins, *Senior Editor, Planning*  
Douglas N. Dickson, *Associate Editor*  
David E. Gumpert, *Associate Editor*  
Alan M. Kantrow, *Associate Editor*  
Lynn M. Salerno, *Associate Editor*  
Dietmar R. Winkler, *Art Director*  
Catharine-Mary Donovan, *Production Manager*  
Jane Hensel Gebhart, *Assistant Production*  
*Manager*  
Pamela M. Banks, *Manuscript Editor*  
Sarah J. Entenmann, *Manuscript Editor*  
Millicent R. Kindle, *Manuscript Editor*  
Geraldine E. Willigan, *Manuscript Editor*  
Edward C. Bursk, *Honorary Editor*  
Ernest D. Frawley, *Publisher*

## Editorial Board

John H. McArthur, *Chairman*  
William J. Abernathy  
Kenneth R. Andrews  
Stephen P. Bradley  
Mary V. Chatfield  
Samuel L. Hayes, III  
Regina E. Herzlinger  
John P. Kotter  
Thomas K. McCraw  
Arthur J. Rosenthal  
Walter J. Salmon  
Benson P. Shapiro  
A. Michael Spence  
Richard F. Vancil  
Michael Y. Yoshino  
Abraham Zaleznik  
Stephen A. Greyser, *Secretary*

## Volume 60, Number 2

The Harvard Business Review, a bimonthly journal for professional managers, is a program in executive education of the Graduate School of Business Administration, Harvard University (John H. McArthur, Dean; Derek C. Bok, President). Copyright © 1982 by the President and Fellows of Harvard College. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the editor. Printed in U.S.A.  
Editorial offices, Boston, MA 02163.  
Second-class postage paid at Boston, MA and at additional mailing offices; POSTMASTER: send address changes to Harvard Business Review, Boston, MA 02163.

- |     |  | Reprint number |
|-----|--|----------------|
| 76  | The moral crisis in American capitalism<br>Robert Wuthnow  | 82212          |
| 85  | Tapping Eastern bloc technology<br>John W. Kiser III   | 82207          |
| 94  | Getting the most out of innovation abroad<br>Robert Ronstadt and Robert J. Kramer                | 82208          |
| 100 | When to advertise your company<br>Thomas F. Garbett  | 82204          |
| 107 | Do's and don'ts of computerized manufacturing<br>Donald Gerwin                                   | 82205          |
| 117 | Get new products from customers<br>Eric von Hippel   | 82210          |
| 123 | Relate hospital charges to use of services<br>Charles T. Wood                                    | 82211          |
| 131 | How to negotiate a term loan<br>Jasper H. Arnold III   | 82201          |
| 139 | Forecasting resurrected<br>Terry W. Rothermel  | 82209          |
| 6   | Growing concerns<br>Don't let inflation get the best of you<br>Neil C. Churchill                 | 82202          |
| 30  | Special report<br>Last rites for pattern bargaining<br>Audrey Freedman and William E. Fulmer     | 82203          |
| 50  | Keeping informed<br>Entrepreneurship: a new literature begins<br>David E. Gumpert                | 82206          |
| 62  | Ideas for action<br>Cost-effective way to spur private giving<br>Robert L. Sproull               | 82229          |
| 68  | Operating cases to help solve corporate problems<br>Christopher A. Bartlett and David W. De Long |                |
| 72  | Keeping your trade name or trademark out of court<br>Frank Delano                                |                |
| 148 | For the manager's bookshelf<br>Stepping out of glass slippers<br>Eliza G. C. Collins             | N.A.           |

# Tapping Eastern bloc technology

*U.S. companies may find  
unexpected treasures  
behind the Iron Curtain*

*John W. Kiser III*

*As the international economy becomes ever more competitive, the United States may be missing a bet in ignoring new technology in Eastern Europe and the Soviet Union. Although Americans tend to see the COMECON countries as technologically backward, some large U.S. companies have acquired licenses for highly useful processes and products from those markets. This author points out some of the difficulties of buying technology from the Communist world and shows U.S. companies how to take advantage of the opportunities.*

*Mr. Kiser was a research consultant to the U.S. Department of State before establishing his own company, Kiser Research, Inc., in Washington, D.C., which specializes in transferring technology from the Eastern bloc countries to the United States and in consulting services on various aspects of East-West relations.*

Popular perceptions change slowly. One of the most persistent is that Communist countries are technologically backward and need Western technology to stay afloat. Most Americans are surprised to learn that companies such as 3M, Kaiser Aluminum & Chemical, Babcock & Wilcox, Deering-Milliken, Bristol-Myers, J.R. McDermott, and many others have purchased patents and know-how from the Soviet Union and Eastern Europe.

Some view buying technology from any foreign country as a blot on our national manhood. How can foreigners have something better than we have? Why don't we have it? Buying technology from a Communist country causes astonishment and concern, especially in the minds of those who think that Communist societies are incapable of innovation.

In the postwar era, Americans were raised on the rhetoric of U.S. technological supremacy. Though the NIH (not invented here) psychology is hardly peculiar to America, it certainly received strong reinforcement in the 25 years following World War II. The tendency, it seems, has been to complacently interpret this condition of supremacy as a reflection of the innate superiority of the U.S. system rather than a consequence of the destruction of the rest of the industrial world and a windfall to America of some of Europe's best scientific brainpower.

American industry can no longer afford to be parochial about technology. The increasing numbers of licenses that U.S. companies are buying from abroad indicates that some attitudes are changing. While the unrelenting pressure of Japanese and German competition has had a sobering effect, it seems as though only Sputniks and submarines that travel at 50 mph under water can keep the United States from being complacent about the superiority of our technology over that of the Soviet Union and Communist world in general.<sup>1</sup>

On the basis of the annual number of domestic COMECON<sup>2</sup> patent applications, it could be said that 30% of the world's brainpower is in those countries.<sup>3</sup> On the basis of numbers alone, keeping informed about developments in selected fields seems worthwhile. Indeed, many American companies do keep abreast of innovations—in optics, ferrous and nonferrous metallurgy, welding, power engineering, polymer chemistry, pharmaceuticals, and other areas—and have impressive libraries to prove it. Nevertheless, barriers of language, geography, politics, and

<sup>1</sup> Newsweek, February 9, 1981, p. 58.

<sup>2</sup> COMECON (Council for Mutual Economic Assistance) is shorthand for Eastern Europe and the Soviet Union, although it actually includes Cuba, Outer Mongolia, and Vietnam.

<sup>3</sup> Jiri Slama, Heinrich Vogel, "Technology Advances in COMECON Countries: An Assessment," Ost-Europa Institute, Working Paper No. 18, 1976. Estimate based on total domestic COMECON patent applications as a percentage of world patents.

prejudice still lead to widespread ignorance of the new technological developments in the COMECON world. It is not only in our commercial interests but also in our security interests to have a realistic appreciation of the civilian technological achievements of these countries.

---

## The track record

One reason why many people conclude that the Soviets cannot innovate is the seeming lack of evidence to the contrary. Furthermore, when relevant examples are found, detractors often disparage them as mere copies, scale-ups, or as otherwise based on Western technology.<sup>4</sup> Much of this debate about the innovation of Soviet and, by extension, other Communist economies turns on distinctions—distinctions between technical innovation and commercial innovation and between “major” versus “minor” innovation and “indigenous” versus “borrowed” innovation.

Moreover, even if we settle on a set of definitions or distinctions for studying innovation in the Soviet Union, a greater problem is knowing what technical advances have, in fact, occurred. The United States has little interaction with the COMECON countries. Soviet patent literature and other publications provide an indication of the number and type of inventions. However, the significance, in technical or commercial terms, of the innovations cannot be readily determined without talking to the developers. It is through commercial and scientific contact that we begin to find out what other countries are doing.

The level of U.S. commercial contact with COMECON countries remains very low by international standards. The size of the Soviet Union, its uneven development, and its isolation make conclusions about its track record risky. Furthermore, the Western academics who write about Soviet technology are usually political scientists and economists who lack technical knowledge and tend to write from a broad, macroscopic perspective.

Yet technology is highly specific, whether in Russia or in the United States: it differs from industry to industry, from company to company within an industry, from plant to plant within a company, and from component to component within a product. The engine may be excellent, but the tires or brakes inferior. Further, product design technology is distinct from manufacturing process technology. Poor quality control can degrade good design technology. Despite these many distinctions, we talk about the technology gap as if it were some absolute condition spanning all of industry.

Even reputable academics speak in broad terms about the condition of Soviet industrial technology. One can only speculate how Gertrude Schroeder of the University of Virginia reached the oft-repeated conclusion that “no branch of Soviet industry enjoys an average level of technology that is even close to being on a par with the United States and the West.”<sup>5</sup>

What is the level of technology in a specific field of industry, and how is it defined? Is it an average of the different parts of an industry? Considering the steel industry, would the level equal iron making plus steel making? To compare steel-making technology, would you take an average of primary and secondary melting, plus rolled and sheet metal production, hot-working and cold-working equipment? Does a high rating in one area cancel out a low rating in another? To what extent is the level a reflection of the particular economic environment or of technical competence? Is the “average” more important than the “best” level achieved in an individual plant or installation? It depends on the questions one is asking.

I will define the track record here in terms of the marketplace—commercial transactions involving proprietary technology licensed to American companies. Focusing on the marketplace helps reduce the problem of defining an innovation: it is something interesting enough for at least one U.S. company to buy.

---

## Reasons for buying technology

For those not familiar with the relatively arcane business of licensing technology, the motto of Dow Chemical's founder, Herbert Henry Dow, gets right to the point: “If you can't do it better or cheaper, why do it?” This belligerently simple question still strikes at the heart of a company's competitive *raison d'être*. The way a company does it cheaper or better can be considered its “technology.” A company's technology can, and should, refer to more than its raw technical prowess.

Good organization, marketing ability, labor-management skills, and a host of other intangibles contribute to a company's technology. I am talking here about technology only in the narrow sense of better products and cheaper processes. Buying technology, unlike buying products, involves acquiring the knowledge base and any accompanying patent rights. Licensing technology is a business form in which one party grants certain use rights to another, as in franchising fried chicken.

Licensing may entail the straightforward granting of a patent right to another party to use

an invention. More frequently, in the case of licensing from the East, know-how is sold together with the patent rights. Know-how may include engineering documentation, operating manuals, manufacturing procedures, start-up technical assistance, and all the tricks of the trade that are in the practitioner's head. Sometimes know-how alone is licensed. This is valuable in situations where the invention cannot be easily copied.

Buying a license in which know-how is transferred can be an economical way to reach a goal or solve a problem. Why reinvent the wheel? In 1975 Texas Utilities Services, Inc. (TUSI) purchased Soviet technology for in situ gasification of lignite coal because the Soviets already had 20 years of experience doing it. In this case, U.S. energy economics had not provided any incentive for developing such a process until recently.

Sometimes individual genius is the reason for a country's technical lead. The soft lens introduced by Bausch & Lomb under a Czechoslovak sublicense was based on a breakthrough in polymer chemistry by Otto Wichterle in Prague. At other times, persistence where others have given up is the basis for a breakthrough. Because of the importance of efficient rail transportation to their economy, the Soviets may have persisted longer than their European counterparts did in developing a mobile, low energy-consuming resistance welding machine that could be used for both on-site pipe and rail welding. The machine makes better and faster welds than conventional methods allow. The Soviets recently licensed the pipe-welding application to J.R. McDermott; the Holland Corporation of Chicago has used the rail-welding versions of the technology on the Washington, D.C. Metro as well as on hundreds of other sites.

Both the East German process used by Diamond Shamrock to produce a feed additive containing vitamin B and the Hungarian technology licensed to Gates Rubber Company for making armored drilling hoses used for pumping drilling mud into oil wells represent, in the eyes of the licensees, better solutions to manufacturing problems.

In a 1977 study I completed for the U.S. Department of State on the scope of technology transfer to the United States from the Soviet Union,

a central question was why U.S. companies had bought the technology. In some cases, the desire to avoid patent infringement was the reason (Soviets, like any other foreigners, can apply for U.S. patents that provide them the same protection as anyone else). In a few cases, companies purchased licenses as a friendly commercial gesture to develop a business relationship. However, of 37 companies interviewed, 30 indicated they purchased the license because they thought it represented a better or cheaper way of doing something.

## U.S. buyers

*Exhibit I* shows some of the more important licenses sold to U.S. companies during the past 10 to 15 years by COMECON countries, "important" being defined as those known to be still active. Others have been abandoned or have lapsed. These licenses either have already demonstrated their commercial value or are still being developed by the licensees in the belief that they offer significant cost savings or market opportunities.

My studies of licensing from Eastern Europe and the Soviet Union show the predominance of process technology.<sup>4</sup> The few product licenses shown in *Exhibit I*—the soft lens, some new drugs, the hydrocyclone for cleaning recycled paper, the underground pneumatic trencher, and the surgical stapling guns—are the exceptions.

It is also of interest that Czechoslovakia and Hungary have sold about the same number of licenses as the Soviet Union, though the former are of lesser value. This points up a difference between doing business with Eastern Europe and the Soviet Union, and the potential for finding technology, which will be discussed later.

Despite the widely acknowledged problems COMECON economies have in moving technology from laboratory to industrial use, a significant percentage of the licenses sold, approximately 40%, were for innovations already in commercial use. However, "commercial" in Communist economies can mean "developmental" in a U.S. context. When U.S. Surgical Corporation purchased patent rights for precision stapling guns from the Soviet Union, the company invested several years and many dollars in refinement and improvement before offering the guns on the U.S. market. For a number of companies, the impact of these licenses has been significant. In two cases—surgical stapling guns and the soft contact lens—the licensees' success stimulated new subindustries.

<sup>4</sup> Anthony Sutton, *Western Technology and Soviet Development 1917-1965* (Stanford, Calif.: Hoover Institute, 1968).

<sup>5</sup> Gertrude Schroeder in "Economic Reform as a Spur to Technological Progress in the USSR," *Jahrbuch der Wirtschaft Ost Europa*, vol. 2 (Munich, 1971).

<sup>6</sup> John W. Kiser III, *Report on the Potential for Technology Transfer from the U.S.S.R. to the United States* (Washington, D.C.: U.S. Department of State, 1977); *Report on Commercial Technology Transfer from Eastern Europe to the United States and Western Europe* (Washington, D.C.: U.S. Department of State, 1980).

Exhibit I Licenses recently sold to U.S. companies by COMECON countries

	Technology	Buyer	Seller		Technology	Buyer	Seller
Medical-biochemical	Surgical stapling guns	U.S. Surgical	USSR	Metallurgy	Electromagnetic casting of aluminum	Kaiser Aluminum & Chemical	USSR
	Soft contact lens	National Patent Development	Czechoslovakia			Reynolds Aluminum	
	Anticancer drugs	Bristol-Myers	USSR			Alcoa	
	Cardiovascular drug	Squibb	German Democratic Republic		Roller dies	Harrisburg Steel	Hungary
	Psychotropic drug	American Home Products	USSR		Electromagnetic casting of copper	Olin	USSR
	Method for producing calcium pantothenate	Diamond Shamrock	German Democratic Republic		Method for titanium nitriding of tool steels	Mukhar Vacuum Systems	USSR
Energy	Cardiovascular drug	DuPont	German Democratic Republic	Miscellaneous	Magnetic impact bonding	Maxwell Laboratories	USSR
	Vitride chemical reducing agent	National Patent Development	Czechoslovakia		Flash butt welding	J.R. McDermott	USSR
	In situ coal gasification	Texas Utilities Services	USSR		Evaporative stove cooling of blast furnaces	Andco	USSR
	Heller-Forgo dry cooling process	Babcock & Wilcox	Hungary		Rock hammer	Joy	USSR
	Method for making armored drilling hoses	Gates Rubber	Hungary		Hefti	Manufacturing	
	OSO dewatering screen for coal	National Standard	Poland		Pneumatic trenching tool	Allied Steel & Tractor	USSR
					Hole Hog		
					Hydrocyclone	Bird	Czechoslovakia
					Triclean	Manufacturing	
					Spray printing of carpets	Deering Milliken	German Democratic Republic
					Inertial core crusher for extra hard rocks	Rexnord	USSR

### Total license trade

The current dimensions of the license trade into the Eastern bloc also need to be put in perspective. In 1969, the latest date for which figures are available, an estimated 50,000 international licensing agreements were in force.<sup>7</sup> A rough, but generous, estimate would place the number of licenses sold by all COMECON countries to market economies since 1965 at around 1,500 (USSR, 400; Czechoslovakia, 400; Hungary, 300; German Democratic Republic, 300; and Poland, Bulgaria, and Rumania, 100). Assuming that one-third are still active, approximately 500 agreements with those countries are still in force. During this period, a West German source estimates that East European countries have purchased 2,400 licenses from the West, including 500 by Yugoslavia.<sup>8</sup>

The value of licenses sold from the whole COMECON area in the last 10 years is less than that paid by the United States for foreign licenses in

one year. According to Department of Commerce statistics, in 1975 the United States paid \$183 million in fees and royalties to non-U.S.-owned foreign companies. By a generous estimate COMECON countries have sold about 100 licenses to the United States over the past 15 years. It is unlikely that total royalties and fees paid exceed \$40 million to \$50 million.

The lower value of COMECON licenses in comparison to those they buy from the West may have several explanations. Often these licenses are for promising technical ideas rather than for commercially proved technology and are therefore worth less initially to the acquiring company. Other considerations that can lead to licenses of lower value are absence of equipment deliveries as part of the package, lower costs for technical manpower, and lack of confidence in the value of the technology.

Also, COMECON countries generally buy technology that is likely to be used on a national or COMECON scale; their purchases are supposedly

part of a plan for filling technological gaps. East European sales to the West are to companies that supply only a small portion of a given market. On the face of it, however, the COMECON track record does not seem very impressive or encouraging.

## Interpreting the record

A number of explanations, besides the apparently obvious one, lack of technology, should be weighed in interpreting the commercial performance of COMECON countries. While there are important differences between Eastern Europe and the Soviet Union, as well as among and within East European countries, the similarities are generally greater. Hence I will risk committing the injustice of describing the licensing problems of COMECON countries as if the area were an undifferentiated whole.

Selling is not part of the economic culture of these societies. Marketing materials are usually poorly written and uninformative. They usually do not highlight the advantages of a technology or compare it with known Western equivalents. Getting the additional information needed to judge the available technology may be time consuming or impossible. Selling involves work and risk, and rewards in these countries are not commensurate, at least not for the commercial people who do the selling.

A related problem is the ignorance of commercial organizations about what technology is saleable in the American market. This is due, in part, to lack of personnel who could ferret out new technology. Westerners are often the most important source of information for the COMECON licensing organizations on potentially useful technology in their own countries. The most commercially successful license sold in the United States, the Wichterle soft lens, came about through the initiative of a U.S. company that learned of the research being done in Czechoslovakia and brought it to the attention of the licensing organization there. This is not unique, however. Western companies also are often unaware that they have something technologically interesting until another company tells them about it.

The lack of market consciousness also affects patent management decisions. The organizations responsible for obtaining foreign patents have a natural stinginess about spending hard currency, a tendency which can be exacerbated by not knowing what might be useful to a particular country. Further, an effective patent strategy requires close coordination among marketing people, patent attorneys, and inventors. They need to answer such questions as: Where is the company likely to sell? Who are the likely competitors? What applications need to be covered? Should the invention be patented or kept a trade secret?

Poor organization in countries where inventing, selling, and patenting take place under separate roofs can result in weak or abandoned patents, inappropriate country coverage, and other problems that can lower the value of Eastern bloc licenses to buyers. A commercially successful patent invites competitors to try to get around it. Consequently, a well-written patent becomes very important, especially if the invention is easy to duplicate.

Since the inventors are likely to be the most knowledgeable about the worldwide state of a particular art, their awareness of an invention's suitability for foreign patent protection is particularly important. Lack of awareness seems to be a greater problem in the Soviet Union than in Eastern Europe and is tied in with the lack of an overall license strategy. According to a Soviet official, ministries have no systematic approach to patent protection for Soviet products and inventions. Of 70 research and design institutes in the Ministry of Instrument Making, he said, only 9 even recommended taking out foreign patents; in the Ministry of Automobile Production, only 7 of 200 research and design organizations recommended such action.<sup>9</sup>

## How good is our knowledge?

The most important reason for the few sales of licenses, particularly to the United States, is the lack of commercial contact. In 1978, Italian exports to the United States totaled \$4.1 billion. By contrast, in the same year, Soviet exports to this country amounted to \$755 million, and exports from the six East European countries to the United States totaled \$518 million. Patent data correspond to the low level of commercial activity with the United States, as shown in *Exhibit II*.

Business people generally agree that the best way to find out what others have to offer is through person-to-person contact. Buying and selling products, attending trade fairs, going to technical conferences, and visiting facilities are typical opportunities for personal contact provided by commerce.

7 According to figures cited by Philip Hanson in his unpublished paper, "The Diffusion of Imported Technology in the U.S.S.R.," University of Birmingham, England, 1976.

8 "Polen, allgemeine Richtlinien für den Erwerb von Lizenzen im Ausland," Report No. 108,

Bundestelle für Aussenhandelsinformation (Cologne, 1978), p. 8.

9 *Ekonomika i Organizatsia Promyshlennovo Proisvodstva*, vol. 1 (Nauk, Siberian Branch Soviet Academy of Sciences, Novosibirsk, 1979), p. 58.

## Exhibit II U.S. patents for residents of foreign countries

	1974	1975	1976	1977	1978
Hungary	15	64	66	69	82
Czechoslovakia	105	121	110	109	93
German Democratic Republic	0	0	0	0	0
Poland	27	32	45	29	32
Soviet Union	444	454	435	399	386
Italy	908	782	866	710	75
Great Britain	242	307	344	283	285
Sweden	644	939	1,118	905	918
Federal Republic of Germany	6,360	5,780	6,800	5,902	5,882

Source: Commissioner of Patents and Trademarks Report - Fiscal Year 1978, U.S. Patent Office.

Squibb learned about the drug it later acquired from the German Democratic Republic as a result of contacts it made trying to sell its own products. Gates Rubber Company bought a license from Hungary after noting that the armored drilling hoses it was buying from Taurus, the Hungarian manufacturer, eliminated certain labor-intensive manufacturing steps. The fruitful cooperation between Zoecon Corporation and the Institute for Entomology in Czechoslovakia and the license sold by the Soviet Union to Energy Sciences Inc. for a compact particle-beam accelerator originated from meetings with scientists who had attended conferences in the West.

Of the nine licenses purchased by National Patent Development Corporation from Czechoslovakia, all but the first resulted from contacts developed through the successful commercialization of the first license for the soft lens. The good contacts Maxwell Laboratories' president has with the Kurchatov Institute for Atomic Power in Moscow led to knowledge of an important breakthrough in the design of induction coils used for bending and shaping hard-to-work metals.

Because a significant portion of the potentially useful technologies from COMECON countries are process technologies or in an R&D stage, personal contact becomes even more important, especially since publications from these countries are rarely in English, or the articles are too vague to be useful. New process technology is not so easy to know about since, to the unskilled eye, the end product may look about the same and be no different in its essential properties. Consequently, contact with the products of the plant or site visits become important ways of discovering different production methods. For example, the Czechs have been casting high-speed steel cutting

tools for 15 years. These are made from higher cost forgings in the United States. An American company interested in purchasing the technology learned about it only by talking to Hungarians who were using the cast tooling.

## Soviet Union vs. Eastern Europe

In certain respects, buying technology from the Soviet Union deserves special mention. There are differences in doing business with the Soviets that help explain why small countries, such as Czechoslovakia, sell about as many licenses as the entire USSR.

One difference is size, and, in a way, size is behind many of the other differences. In the small East European countries, it is easy to know whom to call for information and which of the few organizations to contact. Frequently, only one company or R&D institute engages in a certain activity. It is not likely that you could arrive in Moscow, as someone did in Prague, say you had heard a rumor about soft lenses, and get the licensing agency to start calling institutes around the country that might have developed them.

Access is also better in Eastern Europe. This applies not only to size but to logistics, contact with the sellers, and access to technical facilities. Generally, visas are easier to obtain, and travel can be arranged more simply and quickly. In addition, communication with developers of the technology, as well as the opportunity to observe it, is usually easier in Eastern Europe than in the Soviet Union.

Interestingly, the higher average value of Soviet licenses sold to the United States, compared with East European licenses, may reflect the greater difficulty of buying a license. As some Western licensees have observed, a company doesn't go after a license in the Soviet Union unless it wants it badly. In other words, the potential value of the license must roughly correspond to the value of the time it takes to get information and to negotiate an agreement.

Having dwelled on the negative, I should add that many companies have had smooth negotiations and good experiences, in terms both of access to facilities and of information transfer. Energy Sciences, Inc. had no restrictions on its ability to inspect the particle-beam accelerator used at the Institute for Nuclear Physics in Novosibirsk. Not only did executives from Southwire Company visit the facility in the Caucasus for making aluminum from non-bauxitic alunite, but the Soviets also told them of an improved second-generation process technology that they had not yet introduced.

In a recent study of East European licensing to the West, I asked American and European

licensees about their experience in obtaining information about new technology from East European partners. *Exhibit III* shows the answers from a sample of 45 companies to various questions comparing that experience with buying licenses from Western companies.

The sample has a slight bias in favor of active and successful licensees. Since the European companies surveyed were referred mainly by East European partners, one might suspect that active or successful licensees are likely to obtain a good flow of information from the owner. With the possible exception of pharmaceutical licensees, my own conversations did not indicate any strong correlation. The relative importance of access and completeness and timeliness of information can vary with the company, its patience, and its technical level, as well as the significance it attaches to the technology it seeks to buy.

Regarding completeness of information, 4 of the 11 answers indicated especially poor experiences for pharmaceutical licenses. On the basis of interviews with drug companies, it seems that when information is less than satisfactory, the owner may not be holding back. It may be that the data are simply inadequate by U.S. standards.

## Ingredients in successful contracts

The transfer of technology through a licensing agreement can entail engineering drawings, test data, process know-how, and materials specifications, as well as on-site technical assistance. In describing this process of transferring knowledge, the U.S. licensees of the Soviet Union fall into two broad categories: (1) those who were satisfied, and (2) those who felt the Soviets honored their commitments only if one took an extremely literal interpretation of the wording of the agreements.

An idiosyncratic element in the Soviet system, which may work against total customer satisfaction, is disclosure. Licensintorg, the Soviet licensing organization, is constantly on guard against transmittal by technical people at the various institutes of more information than required under a particular phase of the agreement. Licensintorg's job is to make as much money as possible from Soviet technology, but its staff often lacks the expertise to understand the technical substance. However, all information from the enterprise or institute must pass through Licensintorg to the customer.

One company I talked to had the impression that Licensintorg personnel, lacking understand-

### Exhibit III U.S. and European experience with buying licenses from East European sellers

	Access to facilities to observe technology in operation			Timeliness of information transfer			Completeness of information			Totals
	W	S	B	W	S	B	W	S	B	
Czechoslovakia	2	14	4	5	13	2	4	12	4	20
German Democratic Republic	1	1	2	2	1	0	3	1	0	14
Hungary	1	3	3	1	4	2	2	4	1	7
Poland	0	4	0	1	3	0	2	2	0	4
Subtotals	4	32	9	11	31	4	11	29	5	45
Key:	W Worse than buying from West			B Better than buying from West						
	S Similar to buying from West									
Source:	John W. Kiser III, Report on Commercial Technology Transfer from Eastern Europe to the United States and Western Europe, U.S. Department of State, 1980.									

ing of technical detail, may edit out information that seems to them beyond the agreement's scope—to the disadvantage of the customer. In this view, the aim of Licensintorg is to make additional information the subject of a new agreement.

In contrast, one of several U.S. companies that had very satisfactory experiences was Texas Utilities Services, Inc., which not only got everything it expected but had to turn away information. TUSI received many volumes of information about gasifying coal in the ground, going back over a 20-year period. This massive amount of material had been compiled for TUSI specifically. Institute personnel were even offering drawings of the lighting circuits in the coal gasification building. TUSI President Perry Brittain described the job as highly professional and thorough. Maxwell Laboratories, Allied Steel & Tractor, and other U.S. companies also reported satisfaction with the information they received under their agreements.

Such contradictory experiences are easy to explain if one does not view the Soviet system as monolithic and invulnerable to the vagaries of personality. The attitude, competence, and zeal of the Licensintorg staff presumably varies, which can explain in part the different reports. The other variable is the Western company's skill in negotiating an agreement and in developing friendly relations with the technical people at the institute who have the information.

The quality of personal relations, particularly with the scientific people, is extremely important. The technical documentation that institute personnel have to prepare for the customer is all done outside the normal plan. The scientists' regard for

their counterparts at the customer's company can influence their professional pride and their desire to please. As J. Weisman, chairman of Energy Sciences, Inc., put it, scientists like to think their inventions will "go to a good home." The sophistication of the Soviet institution providing the documentation as well as its experience with selling technology are other important considerations.

All the views I have just described apply in varying degree to Eastern Europe. Successful licensing of technology from COMECON countries requires the same qualities in a business relationship that are expected anywhere—honesty, good communications, mutual respect, and trust. These are obvious to anyone in business. However, as licensing is a special business form in which technical people must often divulge information that is in their heads, developing good personal relationships is especially valuable.

Nevertheless, a few other qualities on the part of prospective licensees carry special force in acquiring technology from COMECON countries:

**Patience.** Information may take many months to be transmitted; consequently, companies with an impatient attitude will soon lose interest and probably should not enter this process.

**The licensee's ability to make important technical improvements.** COMECON technology may either be developmental or at least require substantial "Americanization." Logistical problems in getting technical assistance readily make it very important for a licensing company to have a high level of appropriate technical expertise.

#### **Detailed, carefully drawn contracts.**

Due to the greater possibility of misunderstanding and the danger associated with taking things for granted, the contracts should be precise and well-planned, leaving little room for improvisation. Aside from the lack of a common framework or set of assumptions about the way business should be conducted, the Soviet-style decision-making process requires getting many different organizational inputs. As a result of the numerous organizational actors required to negotiate, there is a strong incentive to stay with an agreed-on set of rules, thereby reducing flexibility after the fact.

#### **Suspension of political doctrine.**

It is important not to let ideological attitudes get in the way of personal relations and a sober assessment of technology that is encountered.

## Need for balance

Many popular perceptions may not be wrong but rather half right. Despite the lack of a competitive environment, there are spurs to innovation in COMECON countries. Probably the most important today is the labor shortage throughout the COMECON area. Simply increasing factor inputs can no longer provide desired growth rates. The countries will have to use their limited resources more productively. Much emphasis is being placed on labor-saving innovation, in addition to working harder and more efficiently.

Further, the system can be a perverse incentive to managers to introduce labor-saving process innovations because of their desire to have a hidden reserve to meet plan demands.<sup>10</sup> Thus a dysfunctional aspect of the planning system—the desire of managers to understate capacity in the face of planners who want to squeeze capacity—can lead to technological innovation as a form of protection.

Though we should not minimize the problems of the COMECON economies, neither should we ignore some of their strengths and advantages. Stable markets with planned demand in a strike-free environment, Poland notwithstanding, make investments in high-productivity, capital-intensive technology possible that would be risky in the more volatile Western markets. The Soviet Union has an enormous built-in market. COMECON specialization agreements have made it possible for small East European countries to become relatively efficient producers of such products as machine tools (German Democratic Republic, Czechoslovakia, Hungary), textile machinery (Czechoslovakia), ships (Poland), medical equipment (Hungary), and industrial robots (Bulgaria).

By having less variety in output, these countries can introduce more efficient continuous processes, where Western producers would have to customize or fragment production to suit real or imagined tastes. Because of greater uniformity of demand and large, unfragmented, and stable markets, the Soviets have been able to invest in expensive equipment for manufacturing long-lasting through-hardened railroad rails, large high-production iron blast furnaces, and aluminum smelters. The Poles have become the only potential U.S. competitor in world markets for agricultural aircraft and other light planes. And through specialization and integrated planning, one East German company in Erfurt produces more stamping presses than does the United States in one year.

Finally, there are a lot of researchers in these countries. Allowing for fuzzy definitions of "researcher" in the lexicons of the various countries,

Soviet and East European countries clearly have consistent goals for developing a powerful scientific base with many researchers. In contrast to our own country, strong scientific and mathematical orientation in the educational systems of these countries, especially the Soviet Union, Hungary, and East Germany, supports this aim.

In the smaller, ever more competitive international economy in which U.S. industry must exist, parochialism about markets and technology will be increasingly costly. Fortunately for the United States and other Western countries, much of the technological potential of East bloc countries is locked in a bureaucratic jungle that lacks the expansive dynamism of Western industry. Ignoring the potentially useful technology of COMECON countries, however, can result in missed opportunities that our more aggressive competitors may seize.

The Japanese steel industry has exploited and improved on many Soviet inventions. Continuous casting, evaporative stove cooling, dry coke quenching, and electroslag remelting are only a few of the technologies picked up by Japanese steel companies, such as Nippon Steel, Kobe, and Ulvac. In the textile machinery business, Enshu, a Japanese licensee of Czechoslovakia, makes almost 75% of the 5,000 high-productivity water jet looms sold in the United States. Hoechst of West Germany has built up a business exporting Soviet high-efficiency filter presses to the United States under a manufacturing license.<sup>11</sup>

Necessity is the mother of invention, goes the old saw. In the competitive crunch U.S. industry now feels, the Eastern bloc is a potential source of ways to do it better and cheaper. ▢

<sup>10</sup> Joseph Berliner, *The Innovation Decision in Soviet Industry* (Cambridge: MIT Press, 1976), p. 167.

<sup>11</sup> *Report on the Potential for Technology Transfer from the U.S.S.R. to the United States*, p. 22.